**IoT based garbage collection and monitoring system**

In metropolitan cities, it is difficult to check every place where the garbage bin yard is full or not.

The overflow of the garbage bin leads to unhygienic environment and this leads to disease spread. So in order to make our environments clean and safe we have proposed a smart system that improves the already existing system.

Arduino Uno

LCD display

Power supply

Power supply

Ultrasonic sensor

Wi-Fi module



Connection between Website Libraries and Project

Web server

Fig Block diagram

**How the system works?**

The system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page.

* Website is developed
* Ultrasonic sensor is placed over the bin to detect the garbage level of the bin
* This sensor feeds data about the status of the garbage to the Arduino
* ESP8266 SoC is connected to the Arduino
* Connection between the website and the Wi-Fi module Arduino is made so as to transmit information to the website through Internet connection
* The LCD screen is used to display the status of the level of garbage collected in the bins
* Whereas a web page is built to show the status to the user monitoring it
* The system puts on the buzzer when the level of garbage collected crosses the set limit

Design of the garbage bin [flow diagram]

Sensor

Municipal car

Data on web server

Sensor data > threshold

Yes

No

Fig 2. Flow diagram

**Database design**

Municipal admin

Garbage-bin

Show

1

N

Fig 3. Database design layout

How the information and the garbage in the dustbin is collected?

Here in Addis Ababa we have 10 sub-city and each sub city have a number of **woreda**. In each woreda, there are N number of garbage collector bins. So, these garbage collector bins will send their status to the central database. For example, if one garbage collector bin is full in bole sub city in woreda 10, then this information is sent to the central database and the central database will send an email to the sub city regarding the status of the garbage bins in that woreda. Because in one trip the garbage collector workers will visit those bins, around 70% to 100 % filled garbage bins.

In each sub city there is a dedicated person who have the duty to see his email, each and every minute.

 

Location, Status

Location, Status

Yeka sub city



Email

Bole sub city

Email

Location, Status

Location, Status

 

Location, Status

Central server/admin office

Location, Status

Location, Status

 

Email

Email

Location, Status

Kirkos sub city

Arada sub city

Location, Status

 

Fig 4 general layout of the transfer of information